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The Pedagogical Use of Didactic Classes for Teaching Cognitive Psychology

ABSTRACT

The didactic class is a pedagogical tool meant to increase classroom interactivity by encouraging student discussion of real-life cases in connection with theory. This paper evaluates the pedagogical impact of using a one-off didactic class where an external expert is brought in to discuss how to relate a cognitive psychology course's content to real-life problems. Using a mixed-methods approach, we measure the undergraduate students' sense of conceptual understanding, their perspective on applying cognitive sciences, their sense of belonging to the department, and their motivation to work. Students' sense of understanding and their perspective in applying cognitive sciences to real-world problems significantly increased after this class. However, we found no significant differences in their sense of belonging to the department or their motivation to study. This suggests didactic classes may further course-specific content but do not change broader aspects of motivation or belonging. The qualitative interviews support the quantitative results. Students reported that the didactic class made them think laterally about content from other modules and how they could apply theoretical insights to real-world problems, which boosted confidence. Students reported great satisfaction with the didactic class. Of course, the speaker must be relevant to the course content, and students should feel empowered and able to speak in class. However, these are practical concerns that should not discourage lecturers from exploring didactic classes as a fun and instructive tool that has significant pedagogical benefits.

KEYWORDS
didactic class, cognitive psychology, teaching techniques

INTRODUCTION

Many aspects of higher education have changed over the twenty-first century (Mathieson 2014). Aside from teaching critical thinking and course content, education is meant to provide expectations of life skills and employability. This encourages students to connect learning with real-world applications and to develop a sense of how theory can be applied to societal problems. In psychological and behavioural sciences (which this paper considers) and social sciences more generally, this is critical, as many graduates may work in public policy, NGOs, companies, and other entities that directly impact society. This creates a host of challenges, as education not only has to provide the space for learning (e.g., introducing students to new perspectives and theories, critical reflection tools), but also to set up students for career progression, societal challenges, and concrete applications of theory. Thus, it is critical to engage students actively. However, engagement is a complex and multi-faceted challenge. For example, if students do not feel an emotional connection

with the material, they are more likely to disengage and show resistance to content (Wimpenny and Savin-Baden 2013).

This shift in teaching prompted discussions about how to improve the student learning experience, an increasingly pertinent topic as students and staff now return to the in-person classroom. A series of reports published by the Open University focussing on how to innovate pedagogy called for an increasingly interactive approach to teaching, learning, and assessment that mirror our interactive world (Kukulska-Hulme et al. 2020). In this view, it is important to move beyond monological lectures and toward interaction and dialectical models of learning. This increase in interactive teaching goes hand in hand with an increased focus on the wider outcomes of university education as the emphasis on grades lessens and attention to things such as moral learning, practical application, sense of belonging, and academic self-efficacy increases. This is reflected in the increasing number of surveys and studies focussing on subjects like wider participation and perceptions of teaching styles by university students. The COVID-19 pandemic further showed the value of in-person teaching. Watching lectures at double speed, awkward breakout room discussions, and zoom fatigue became the norm for increasingly frustrated students (Kedraka and Kaltsidis 2020).

While the word "didactic" has been used to describe different kinds of teaching, we use "didactic class" in a specific way in this paper. Following Zuckerman et al. (2020), we take "didactic class" to mean a pedagogical tool that aims to increase interactivity in the classroom by encouraging student discussion of real-life examples. In this paper, we evaluate the pedagogical impact of a one-off didactic class in teaching undergraduate cognitive psychology where an external expert is brought in to discuss how to relate content they have been taught in lectures to real-world problems. Specifically, as discussed below, the external speaker asks the students to link psychological and behavioural science insights to medical problems (such as decision-making in stressful conditions) and to propose interventions that may lessen human errors in medicine.

Didactic classes have typically been used in medical teaching, but their use in social science teaching is beginning to be explored (Simiola et al. 2018; Zuckerman et al. 2020). There is no unified definition in the literature for didactic teaching. When discussed in the literature, didactic teaching typically has one of two definitions. The first refers to didactic teaching as being a "traditional" method, wherein the teacher delivers verbal instruction, and students absorb by listening (Kember et al. 2004). The second refers to didactic as a learner-centred pedagogy, which changes the role of the teacher from instructor to facilitator and encourages the active participation of students by placing them at the centre of the classroom (Moate and Cox 2015). Some literature terms this as a constructivist rather than a didactic approach, but they refer to the same pedagogy (Fernando and Marikar 2017).

A good example of didactic teaching in medical settings is when guest speakers are invited to lead discussions with students which focus on real-world scenarios (Shaffer and Small 2004; Zuckerman et al. 2020). Adopting a didactic approach has been shown to have a positive impact on students' learning, bolstering both grades and generic skills such as problem-solving and decision-making skills (Aguilera and Perales-Palacios 2020; Virtanen and Tynjälä 2019). Given recent efforts to innovate university pedagogy and make it increasingly interactive, this study is well-placed to explore the effects of a didactic approach on university students' learning.

Via didactic classes, in-group discussions and classroom debates can facilitate different types of knowledge creation (Kennedy 2007). For one, open discussion enables students to query theoretical assumptions or modelling tools directly and more informally. This is extremely useful, as they can discuss ideas and approaches with each other, ask the teacher direct questions on the

readings, and co-construct meaning around ideas and applications. In line with this, Biggs and Tang (2009) argue that "Teachers need to focus on changing the learner's perspective on their learning, so they fully understand and engage with the learning at the appropriate level" (Mathieson 2014, 67). This takes a constructivist perspective where learning and belief revision is a social practice.

This paper explores the pedagogical effects of using a didactic class to teach second-year undergraduates completing their degree in psychological and behavioural science. As presented in the context section, the class is led by a guest speaker (a medical professional). The students are presented with three scenarios which they will discuss in small groups before sharing their conclusions in a wider class discussion facilitated by the guest speaker. Students will complete the same quantitative survey before and after the didactic class takes place. A subset of these students will then be chosen (via opportunistic sample) to participate in semi-structured qualitative interviews. The independent variable is participating in the didactic class, and the dependent variable is students' perception of the class.

This research will make a valuable contribution by speaking to several gaps in the literature. Most research to date has focussed on the adoption and perception of didactic teaching from university lecturers' perspectives and didactic teaching in medical settings. In rare cases where this pedagogy has been trialed with social science undergraduates, the main focus has been the effect of this pedagogy on grades (Aguilera and Perales-Palacios 2020; Barraket 2005; Naveh, Tubin, and Pliskin 2012). By contrast, this research will investigate the student perception of this pedagogy by focussing on elements such as academic self-efficacy, sense of belonging, motivation, and usefulness of the class in the context of students' wider learning. To the authors' knowledge, this is the first study that will focus on investigating student perceptions of the class, rather than focussing on grades or teacher perspectives. As such, we explore the following research question:

RQ: Whether practice-led didactic classes impact students' sense of understanding of core concepts and their sense of belonging on their degree

Based on prior literature, it is expected the didactic class will have a positive effect on participants' sense of belonging and motivation (Sutherland et al. 2018). However, as, to the authors' knowledge, this is the first time this type of experiment is being conducted on a UK, social science undergraduate sample, it is difficult to make predictions using past research. As such, we propose the following hypothesis:

- H1: There will be a statistically significant difference in the survey responses before and after the didactic class is delivered.
- H0: There will not be a statistically significant difference in the survey responses before and after the didactic class is delivered.

Thus, the purpose is to test if didactic classes improve understanding and a sense of belonging, which are both core to the student experience. In the following, we describe the context in which the didactic class is delivered.

CONTEXT
Course structure and class content
The didactic class was trialled in a cognitive psychology course. This is a mandatory module for second-year psychological and behavioural science students. It is designed to provide an introductory overview of cognitive psychological methods, theories, and models and presents a variety of topics (e.g., attention, memory, and reasoning). Each week, students have a one-hour lecture (where all 40 students are present) and a one-hour class (with 10 to 15 students). The former is more monological (although students are encouraged to ask questions during lectures), while the

latter is more dialogical and task-oriented (e.g., students present work in front of each other). At the end of the course, students are assessed via two summative projects: a group project where the students make a video presentation of core cognitive psychological concepts and an individual essay where they reflect on the application potential of cognitive theory to real-world problems.

As discussed in the introduction, social science teachers must find didactic tools to connect theoretical insight with real-world applications. However, this challenge is more pronounced for courses that present more abstract content. Compared with other disciplines in psychological and behavioural sciences, such as social psychology and individual differences via psychometrics, cognitive psychology can be somewhat abstract for students, and theories typically are built on mathematical models of functions such as memory, attention, or belief revision. For example, in the course, students are introduced to Bayesian cognitive models (Oaksford and Chater 2007). These are mathematical models that describe how people integrate new information with their prior beliefs, which is grounded in people's subjective degrees of probabilities regarding elements such as argument strength (Hahn and Oaksford 2006), source credibility (Harris et al. 2015), and perceived relationships between information sources (Madsen, Hahn, and Pilditch 2020). While this points to real-world applications, students must connect mathematical models to societal issues like misinformation, which can present abstract challenges. Further, Bayesian models deal with people's subjective degrees of beliefs. This points to philosophical questions such as what a belief is, how it differs from attitudes, and how we can measure beliefs. Thus, while Bayesian models point to societal questions, students must understand the mathematical principles, consider philosophical concerns around what constitutes a belief, and consider experimental design to apply cognitive models to real-world problems. As such, a didactic class where students can discuss theory in relation to practical problems is especially interesting for abstract courses like cognitive psychology, as it may help students to understand core, abstract concepts by applying them to real-world problems.

The didactic class replaced an ordinary one-hour class. Rather than the class structure with 10 students, the didactic class was a special two-hour class where all students were present (everything was approved by the department with regard to COVID-19 regulations, student and guest safety, etc.). A key aim of the class is to empower students and show them that their degree has practical relevance. The external speaker was therefore chosen from outside academia to ensure that students could relate their theoretical knowledge to practical problems. A surgeon from the field of obstetrics and gynaecology (one of the co-authors of this paper) was invited to lead the class.

The surgeon presented three real cases from medical practices where human errors had led to undesirable outcomes. After the speaker presented a case (which takes five–seven minutes), the students were asked to relate the case to psychological and behavioural insights from their cognitive psychology class as well as throughout their undergraduate degree. They were divided into small groups of four–five students and given 10 minutes to discuss how to use theoretical insight to diagnose the possible cause of the human error, how theoretical hypotheses could be tested (and the practical and ethical limitations that the medical case presented), as well as potential interventions that could alleviate the risk of similar human errors occurring in the future. After this 10-minute group debate, the entire class had a 10-minute open discussion where students presented the ideas and suggestions their group had discussed concerning the case. The surgeon would then present what the medical community had done in response to the cases to show the students where their ideas and suggestions overlapped or diverged from actual interventions.

As an example of a case, students were introduced to the case of Elaine Bromley, a 37-year-old woman, admitted for minor surgery which was assessed and carried out by senior members of staff.

Despite the excellence and experience of the medical team, several human errors contributed to the death of Elaine. To ensure a pathway for oxygen during the procedure, doctors had to initially intubate the patient, which is a standard procedure. The doctors were unable to intubate. Usually, this should not have been an issue, as "can't intubate, can't ventilate" has clear procedures (four successive plans). However, even though they should have moved to plan B after three minutes of intubation attempts, the (experienced and highly skilled) doctor did not move away from intubation (plan A). Scrub nurses (who were also aware of the intubation progression plan) left the relevant equipment next to the medical team who never made use of it. Instead, they persisted with plan A, and the nurses did not raise alarm. The doctors had no concept of how much time had passed, as they had been so focussed on succeeding with plan A. The nurses, outranked in power and expertise, did not speak up, but left the equipment for other plans next to the medical team. The doctors kept with plan A for 15 minutes, after which they awoke Elaine—however, due to the lack of oxygen during intubation, Elaine subsequently died. The sad case of Elaine Bromley eventually led to the creation of The Patient Safety Movement Foundation to raise awareness of human factors in healthcare. In the didactic class, the case inspired discussion on theories of hierarchy in communication, subjective distortions of time given extreme attention, cognitive load, subjective beliefs, and more. These concepts are addressed in cognitive psychology and students' wider degree (e.g., social psychology and behavioural science). Students can draw on these concepts to explain possible root causes for human errors, use their terminology to clearly articulate these insights, and use the discussion to suggest interventions.

The didactic class is hosted in week 9 of the term (the term is 11 weeks, including a reading week in week 6, the halfway point in the term). The placement of the class was chosen for two reasons. First, students have at this point acquired sufficient insight into cognitive psychological theories, approaches, and methods. This gives students a vocabulary to apply to the problems (notably, they are encouraged to use all their insights from their degree and not just concepts from cognitive psychology). Second, the placement gives students time to choose topics or methods for their summative assessments (which are due a month after the class). If the didactic class was in the last week of the term, this might be less helpful. As such, the timing was chosen to maximise their exposure to theory and give students time to use insights in their assessments. In this paper, we evaluate the didactic impact of the class, using quantitative and qualitative methods.

Methods and materials

For methodological purposes, we consider the pros and cons of quantitative and qualitative investigations. On the one hand, a quantitative survey can be used to test measurable differences before and after the class, such as if students believe their degree has practical application potential. While this would offer structured comparisons, it would not allow for individual voices and more subtle responses to the class. On the other hand, qualitative interviews allow for less structured and constrained conversations about students' experiences in the class. This allows for the exploration of issues that may not have been anticipated in quantitative surveys. Given the strengths and limitations of both approaches, we adopt a mixed-methods design that surveys all students (using a quantitative survey) and subsequently interviews a subset of the students (using semi-structured qualitative interviews). The aim is to expand on quantitative survey results with qualitative interviews in an explanatory sequential design, allowing for interpretative design.

For the quantitative part, the survey was created in and distributed through the Qualtrics platform to participants. It contains five sections which include questions covering the topics of "sense of belonging and learning community," "metacognitive and study strategies," "teaching and

learning on the students' course," "intellectual motivation" and "context specific questions". All questions (except "context-specific questions") were based closely on the TASO Widening Participation Questionnaire and the UK National Student Satisfaction Survey, as these surveys have been validated and are used in the context of UK universities. That is, the categories are in line with UK standard measurements. As the TASO questions are generic, we had to adopt the questions to cognitive psychology; the context-specific questions are written by the authors of the paper, as specific references to the course context could not be extracted from external sources.

Each section contains five to seven questions. For example, in the section that relates to student understanding of the course material, students are asked to evaluate the following: "I can clearly explain my ideas, even when discussing complicated things." Participants are given a 5-point Likert-type scale response options, which are the same for every question. They range from "strongly disagree" to "strongly agree." Response coding is as follows: Strongly disagree (1) – Disagree (2) – Neither agree nor disagree (3) – Agree (4) – Strongly agree (5).

The survey is issued to participants before and after the didactic class. The same survey is used pre- and post-class, barring a couple of amended questions (i.e., changes in wording from past to present). Having the same survey allowed direct comparisons between students' understanding, sense of belonging, motivation, and perspective pre- and post-didactic class.

Alongside the pre- and post-class surveys, students were asked if they would participate in a qualitative interview concerning the didactic class. Recruitment was opportunistic, as only students who wanted to be interviewed engaged with this portion, and 11 students participated in the interviews. We are aware of the fact that this sampled subset was most likely happy with the class, potentially skewing results. However, as reported below, the qualitative results are in line with quantitative observations—further, as mentioned, the course was rated very favourably overall. As such, we believe the interviewees are somewhat representative of the student cohort experience. The interview is made up of 10 semi-structured questions. These questions were based on questions used in past studies to maintain congruence with the literature but also contained questions relevant to this study's context (TASO 2022; UK NSS 2022). Beyond the questions, we also included a free question that encouraged students to reflect generally on their experience and invited them to share anything they wanted.

Participants

It is not appropriate to conduct a power analysis in the context of this study due to practical constraints. Thanks to the nature of the experiment, there is a finite and specific cohort from which participants can be purposively sampled. This sample has an upper limit of 40. The nature of this mixed methods experiment is highly exploratory, and given experimental constraints, the methodological decision to omit an a priori power analysis is justified. The use of a single class group of around 40 students to conduct such an exploratory experiment is congruent with previous similar studies (Barraket 2005; Fernando and Marikar 2017).

For this study, the sample was an undergraduate group of 40 students. All participants were second-year undergraduate students undertaking the Bachelor of Science (BSc) psychological and behavioural science degree course at London School of Economics and Political Science (LSE).

Purposive sampling was used to recruit these participants, since these students, as part of one of their courses (cognitive psychology), will undertake a didactic class. As an incentive for taking part in the surveys and interviews, participants will be entered into a prize draw to win a £25 Amazon gift voucher. Sample characteristics include participants being between the age of 18–21, being able to

speak English to a native proficiency (defined as the ability to pursue undergraduate level study in English), pursuing undergraduate study with a gender balance of 34 female, five male, and one non-binary student. As all students were second-year undergraduate students, we did not record age, as it would not be useful for analysis. However, all students were between 18 and 20 years old. Inclusion criteria for the pre-didactic class survey will be that participants must be aged 18 or over, and inclusion criteria for the post-didactic class survey and interviews will be that participants must be aged 18 or over and have attended the didactic class.

For the qualitative interviews, we encouraged students who had attended the didactic class to volunteer. The interviews were conducted after the quantitative surveys (as students were asked to fill in the surveys at the end of the didactic class to maximise responses). In total, 11 students agreed to be interviewed. The interviews included 10 female and one non-binary students; none of the five male students agreed to be interviewed.

RESULTS

We collect both quantitative data (via the survey) and qualitative data (via interviews). In the following, we first report results from the survey and then from the interviews. The questions cluster around four main categories: sense of belonging, motivation, understanding, and perspective.

Quantitative results

The surveys make up the quantitative portion of this mixed-method study. The outcome variable is the participants' responses to the questions. The analysis of the pre- and post-survey will examine whether there is a significant difference between the sets of responses. First results will be screened and cleaned. Participants who did not complete all sections were not included; they were removed via a listwise deletion strategy. Outliers above or below three standard deviations would be removed (Osborne 2012), but we did not find any extreme outliers. An independent t-test (two samples) between the pre- and post-surveys will compare participants' answers. The mean, standard deviation, degrees of freedom, and p-value will be reported. In the following, we report the results of the didactic class.

Participants are second-year undergraduate students and therefore do not differ significantly in age. Five students identify as male, one as non-binary, while all other students identify as female. Finally, by virtue of being in the same course, students have achieved the same level of education. Given the homogeneity across these variables, we do not test for demographic differences.

First, "belonging" refers to the students' experience of belonging to the department more generally. For example, students were asked to rate their agreement with statements such as "I made the right decision in choosing to study with this department" and "I feel part of a group of students committed to learning." In the pre-class survey (measured on a Likert scale from 1-5), students generally felt a sense of belonging to the department (m = 4.076, s = 0.54). In the post-class survey, we notice a small increase (Cohen's D = 0.25) in their sense of belonging (m = 4.227, s = 0.66). However, when comparing pre- and post-class results in an independent t-test, we find no significant differences (df = 1, t = 1.020, p = 0.311).

Next, "motivation and ambition" refers to students" overall desire to work and engage with course content. In this category, students were asked to rate their agreement with statements such as "[the course[1] in cognitive psychology] has challenged me to achieve my best work;" "[this course] has stimulated my enthusiasm for further learning;" and "I have found [course] motivating." Similar to responses on belonging, students in the pre-class survey reported a strong motivation going into the class (m = 4.205, s = 0.64). In the post-class survey, there was a small increase (Cohen's D = 0.33) in

student motivation (m = 4.406, s = 0.53). As with sense of belonging, this increase is not significantly different from their pre-class score (df = 1, t = 1.402, p = 0.166).

"Understanding" refers to students' sense that they can explain and understand the core concepts taught in the cognitive psychology course. In this category, students were asked to rate their agreement with statements such as "I feel I have understood [course] content so far;" "I can clearly explain my ideas, even when discussing complicated things;" and "I can confidently explain my ideas in small group discussions." This is an important category, as it directly measures students' relationship to the core theoretical foundation. In the pre-class survey, students report a reasonable level of subjective understanding (m = 3.882, s = 0.53). It is not surprising that this score is a bit lower than sense of belonging and motivation, since students can be worried about their theoretical understanding. The post-class survey showed a marked increase in their sense of understanding (m = 4.207, s = 0.47). When comparing pre- and post-class responses, we find a significant difference (df = 1, t = 2.620, p = 0.011). When looking at Cohen's *D* effect sizes, this is a medium effect (Sawilowsky 2009) with a score of 0.63.

Finally, "perspective" refers to the students' capacity to understand how cognitive psychology relates to other psychological and social scientific disciplines and how it may be applied to real-world problems. For example, students rated their level of agreement with statements such as "My course has provided me with opportunities to explore ideas or concepts in depth;" "My course has provided me with opportunities to bring information and ideas together from different topics from the wider degree programme;" and "My course has provided me with opportunities to apply what I have learnt to the real world." Even though pre-class survey results were somewhat high in this category (m = 4.308, s = 0.47), we observe an increase in the post-class survey (m = 4.563, s = 0.51), which is statistically significant (df = 1, t = 2.131, p = 0.037). Like understanding, Cohen's D yields a medium effect size of 0.52.

In all, the results were encouraging. We found significant differences in the students' sense of understanding and applying cognitive concepts as well as in their perspective of the cognitive psychology module. This suggests that students found the didactic class useful in increasing and expressing their understanding of core theoretical concepts as well as how these can be applied to practical problems outside of university. This indicates a strong educational benefit to hosting didactic classes.

On the other hand, we do not see significant differences in students' sense of belonging on a departmental level or in their general motivation and ambition to work hard. However, this is hardly surprising, as these refer to concepts that may go beyond the individual course. A student may feel a sense of alienation or strong attachment to the department prior to the class, which may depend on their social life within the student cohort, their involvement with university clubs, their engagement in departmental events, and other factors. It is not surprising that a single didactic class does not change how they feel about the department overall. Similarly, it is not surprising that the class did not significantly change their overall motivation to achieve good results and work hard, as these are characteristics that also go beyond any individual class. Overall, the quantitative results suggest that didactic classes are beneficial for core aspects related to learning, such as understanding and application of theory, but that they do not change wider stances, such as student motivation to work or sense of belonging.

Qualitative results

Using the methodological recommendations of Braun and Clarke (2006) to analyse the qualitative interviews, we note that, in line with quantitative findings, interview responses yielded three main themes: perception of cognitive science, class experience, and learning. In the following, we describe these in more detail and exemplify them with quotes.

Theme 1: Perception

The theme of perception in the qualitative study refers to the students' perception of their learning and understanding of the course, and how students perceive the course material. This amalgamates elements from perspective and the quantitative analysis. Overall, students said their understanding and perception of cognitive psychology changed after the didactic class, both in terms of their appreciation of theory and application of the field more generally. As one student noted:

> I think it's really good if you can actually apply the knowledge. That's what stuck to me the most afterwards. Because before I couldn't quite understand how the concept applies to the real world. But then when we saw like, the different types of problems and cases that we had on Monday, I was able to really record everything. Like, it was really fun as well.

This highlights the pedagogical benefit of discussing a theoretical concept in relation to a concrete case study. When students had to actively link theory to practice, it forced them to think differently about the theory in the first place. It was no longer a disembodied concept, but something with a direct link to potentially improving people's lives through intervention. Another student reflects on how practice clarifies theory: "I think it was, it was very satisfying to realize, or to have some sort of evidence that you've understood the concept okay."

The class made students reflect on the types of jobs that their degree could yield. Again, it appears that the didactic class can serve as a reflection tool on how their theoretical insights can translate into actionable advice.

> Like in the past, I've been told that psychology is so widely used. Like, with a psychology degree, you can go to anything you want. But I did not have a concrete idea of how it's actually being applied to different things. So in this case, we all know that in hospital settings, we might need more psychiatrists or a therapist, to conduct mental health problems with people, but I've never considered it in the context of like actual surgeons, like producing the work in countries on psychological issues that may result in like, devastating consequences.

On a broader level, reflecting on how interventions based on psychological and behavioural scientific recommendations may affect real people in real situations, several students discussed how the class made them think about people who may be the target of such interventions. One student put this nicely:

> . . . This doesn't necessarily sound kind of nice that you do, after a lot of psychology, kind of always have to dehumanize the people that you're learning about, okay? In the sense that you might think there was a brain that is being rational or irrational . . . it's kind of this re-humanizing the brains that were looking at in that class. Because, it's like,

oh, these aren't just the person acting in the in-group or the person from the individualistic versus collectivistic culture. No, this is the doctor with his family or the wife, you know, it's kind of you yet bring it back into its context, mix it with more applicable but also more intuitive.

Many psychological and behavioural science students eventually work in businesses, NGOs, and governments after they graduate. This means that many students will influence or advise on interventions that affect people. Theory can, sometimes, de-humanize people by categorising them according to labels. While classifying people via psychometrics such as personality types or levels of perfectionism can be theoretically justified and important, it can simultaneously be mentally distancing, as the people can become their labels. If didactic classes make students reflect on the personal and humane impact of interventions and theory, it is a very welcome aspect for them to take away.

Theme 2: Class experience
Overall, students' experiences of the class were positive. When asked in the post-class survey if they enjoyed the class, one student said "no" while 32 students said "yes." Further, when asked if they would like to receive more didactic classes like the one evaluated here, three students said "no" while 30 students said "yes." This sentiment was also reflected in the interviews:

I think if we have more of these classes, and we have, two or three real world issues, and then you're embedding it in your module. I think it's quite useful, just like, help you see different sides of things.

The quantitative and qualitative responses suggest that students found the class intellectually useful (in furthering their understanding and perspective) and enjoyable (indicated by the fact that almost all said they enjoyed the class). A few factors influenced this positive experience. First, students were encouraged to reflect on theory and were given time to do so: one student said, "with the didactic class, I think it's really good when they ask you a question, and they give you a time to kind of force you to think about it."

Second, emphasis was placed on creating a space where students would feel empowered, yet not compelled to speak. For example, when students suggested interventions that the medical field eventually introduced, the external speaker noted this in class discussion to encourage students to suggest more ideas: as one student reflected, "I mean, there was no pressure, but it was like putting us on the spot of like, Oh, what are the interventions?"

In addition to giving students the space to feel empowered to speak, it is paramount for them to feel the external speaker has relevant expertise, can connect with them, and can convey the problems in a digestible manner. For the present class, students appreciated the speaker: "Like, she explained everything really well," one student reflected.

Students also appreciated that the external speaker could bring a different perspective on their theories and ideas compared with lecturers they have taken courses from in their degree. One student said, "It's exciting to have someone not in the department or someone you haven't really been taught by. And someone who like works in a different industry."

While students appear to have enjoyed the didactic class (in addition to finding it intellectually useful), the quantitative results show that their sense of belonging did not significantly change after

the class. As discussed above, this is not surprising, as belonging refers to long-standing practices that go beyond one class. As one student noted:

> I think just because it's quite hard. One and a half years in, when there's already like, a group dynamic. And there's already a certain way that we do things. I don't think that cohort is that like, separate, necessarily, but I don't know how much you can really add to a sense of community through a 2-hour class.

This again indicates that teachers should not expect one didactic class to yield cultural shifts (e.g., in motivation or sense of belonging). Of course, it is possible that a series of didactic classes impact motivation and sense of belonging. Here, we evaluate the pedagogical impact of a one-off didactic class. Instead, it should be seen as a powerful pedagogical tool that allows students to connect theory with practice as well as to create a space that students clearly enjoy. Students had a positive experience of the class. However, for this to happen, it appears important to create space where students feel empowered to speak, and that the choice of external speaker is relevant to theory as well as intervention discussion, and that students see the relevance to the course material and their assessments.

Theme 3: Learning
Learning refers to the impact of the class on student's understanding of course material, rather than their perception of their own understanding. However, learning concepts and the perception of relevance often overlap to some degree. Many interviewees reported that cognitive psychology at first seemed to be a very abstract course, which they struggled to understand. Many compared it with social and biological (the two other modules they were taking that term) and said social was the easiest, as the source material is relatable and intuitive, while biological was challenging because it involved learning scientific material they hadn't previously covered. Many reported that cognitive seemed to be the most isolated, as it was very model-based and mathematical. This is in line with considerations mentioned at the beginning of this paper where social science courses based on mathematics can appear more abstract, creating pedagogical challenges. After the class, many students reported that the models they had studied made more sense, and they had a refreshed understanding of how they could be systematically applied to real-life scenarios. One student noted:

> it's useful to know that the knowledge we have can be applied to different settings and things that are important, like health care where sometimes it feels like the doctor should know what they're doing. But it's quite cool that, as someone who's not an expert in like healthcare, you can also have a useful angle into policymaking there. This is really cool, especially, as I'm interested in going into policymaking in the future.

Some students reported that the didactic class made them reflect on theories and concepts from their overall studies more generally. For example, one student noted:

> So, I liked that the class kind of let us look at these different cognitive concepts that we talked about, are a bit more of a real-life scenario, and also linked to behavioural science. Because when we're talking about the interventions, like attention, there was like, conversations about divided attention, and all of these things, which we'd learn

about in cognitive psychology, but also these like bigger concepts that we talked about, like cognitive load, and all of these different things in [two other courses] as well in in first year, and just behavioural science in general. So, I liked that it kind of mixed the different courses a bit more in my head. Because I think that sometimes you can compartmentalise the things you learn, and not really think about it in like one big thing, which you actually have to do.

It is positive if the didactic class supports students in reflecting on concepts from other courses. The psychological and behavioural science degree at LSE encourages lateral thinking across course modules and favours a connected curriculum (see e.g., Fung 2017). For example, in year two, students have five mandatory modules (social psychology, cognitive psychology, individual differences, biological psychology, and developmental psychology). In an integration essay, students select a concept from one of these (e.g., a Bayesian model of belief revision), present it, and critique and broaden the concept via insights from other courses (e.g. using individual differences to critique Bayesian models, which often use aggregate population predictions). If the didactic class helps students bridge the intellectual gap between modules, it is intellectually helpful and broadens their understanding of how to approach problems rather than thinking in a siloed manner. But it also helps their preparation for the integration essay. In this instance, the course convener can encourage lateral thinking by actively suggesting it as part of the didactic class when discussing concepts.

Overall, the qualitative interviews support insights from the quantitative surveys. The interviewed students reported satisfaction with the didactic class, felt they could understand core concepts, and felt empowered to connect theory to practical problems. Of course, as interviewee selection was opportunistic, it is possible that sampling may have skewed, sampling students with more positive experiences. However, it should be noted that the course convener deliberately did not take part in the interviews to create a safe space for students to report what they felt. If the course convener (who would eventually mark assessments) had been present, it could have created a space where students could not be honest. Thus, the course convener was not present, and all quotes were anonymised so that he could not see who said what. Further, as 32 out of 33 students reported that they found the didactic class enjoyable, it is reasonable to assume that the interviewees were not extreme outliers.

CONCLUDING REMARKS AND LIMITATIONS

This paper uses a mixed-methods approach to evaluate the pedagogical potential of using a didactic class for teaching cognitive psychology to second-year undergraduate students. We hypothesised that "There will be a statistically significant difference in the survey responses before and after the didactic class is delivered (H1)." We found partial support for this hypothesis, as we see a significant increase in students' feelings of understanding and their sense of perspective in relation to the course. However, we do not find significant differences in their sense of belonging to the department or their motivation to study. As discussed above, this may not be surprising. "Understanding" and "perspective" are course-specific categories related to students' knowledge of cognitive psychology. The class activities specifically targeted course-related content, as students were asked to reflect on theoretical concepts related to practical problems. Comparatively, "belonging" and "motivation" are broader categories that reach beyond the cognitive psychology course. For example, whether students are happy with their choice of degree or whether they are motivated to work on their studies hardly depends on the course-specific content of one class. As

such, it is not surprising to see that course-specific considerations (understanding and perspective) significantly increased after the class while general considerations (sense of belonging and motivation to study) did not.

There are several limitations to our capacity to make strong inferences. First, the survey and interviews were conducted with one cohort engaged in one course (cognitive psychology). Second, pre-class surveys already produced relatively high scores for all categories (between 3.88 and 4.3 out of 5), making it hard to significantly increase scores. More generally, the course is ranked highly among student cohorts (scoring an overall 4.8, 4.9, and 4.9 out of 5 on student evaluations across three years). It is plausible that a course ranked lower at the onset may experience a greater increase in the categories measured, but we remain agnostic with regard to this. Third, while the results suggest that cognitive psychology lecturers can use didactic classes to increase student understanding and perspective (as well as enjoyment), it is plausible that other branches of social sciences, such as economics, sociology, and anthropology, might benefit from the same pedagogical method. However, we cannot make that claim strongly, as we only have results from the cognitive psychology course. Finally, while we report significant increases in understanding and perspective, it is worth noting that these are self-reported. It is possible that actual understanding and perspective did not increase. Nonetheless, students' perception of the application potential of their degree is important. While we remain agnostic concerning any improvement in analytical skills, didactic classes appear very useful in linking theoretical insights to practical relevance, which is essential for students when considering what they want to do after their degree is done.

On a larger level, it would be fascinating to broaden the content of the didactic class. The class evaluated in this paper dealt with medical scenarios from the UK and the USA. In social sciences and humanities at UK universities, reading lists tend to be based on authors and studies that emanate from European and North American traditions. This problem has been empirically established. An article from 2008 showed that approximately 95% of psychological studies studied participants from western educated, industrialized, rich, and democratic (WEIRD) societies (Henrich, Heine, and Norenzayan 2010), with most studies looking at participants from the USA (Arnett 2008). While there have recently been movements to recruit participants from other societies, data from WEIRD countries still disproportionately feature in class teaching and lectures. To encourage a more global perspective, it would be interesting to organise didactic classes with external speakers from non-WEIRD contexts.

Overall, though, the results encourage the use of didactic classes. Students enjoyed the class (and desired to have more like it). They felt that the class increased their understanding of core concepts and their ability to put their learning into a broader perspective. Finally, they reported that the class made them reflect laterally across modules in order to connect theories. These results are supported by the quantitative as well as qualitative results. Given the significant changes to understanding and perspective, the overwhelming majority who enjoyed the class, and the positive response in the interviews, it appears that didactic classes are a useful pedagogical tool for teaching cognitive psychology (and, presumably, social sciences more generally). As one student put it:

> I think that kind of opened my eyes a little bit to how much you can actually use psychology and behavioural science and all of these things . . . I think that a lot of the time we talk about [interventions] in quite simple policy ways of like nudging or nudge to do this, and it's not very immediate, it feels like it's quite indirect . . . This was a very direct, very tangible example. And I think it was very interesting to see like real life consequences and realised solutions very quickly.

These results encourage the use of didactic classes for teaching cognitive psychology. The class must be curated so that the external speaker is relevant to the course content and so students feel empowered and able to speak in class. However, these are practical concerns that should not discourage lecturers from exploring didactic classes as a fun and instructive tool with significant pedagogical benefits.

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NOTES

1. This course forms part of the wider degree programme students participating in this experiment were undertaking.

DISCLOSURE

Generative AI and/or AI-assisted technologies were not used at any stage.

ETHICS

Research was approved through the London School of Economics and Political Science ethical review processes (ID: 143444).

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